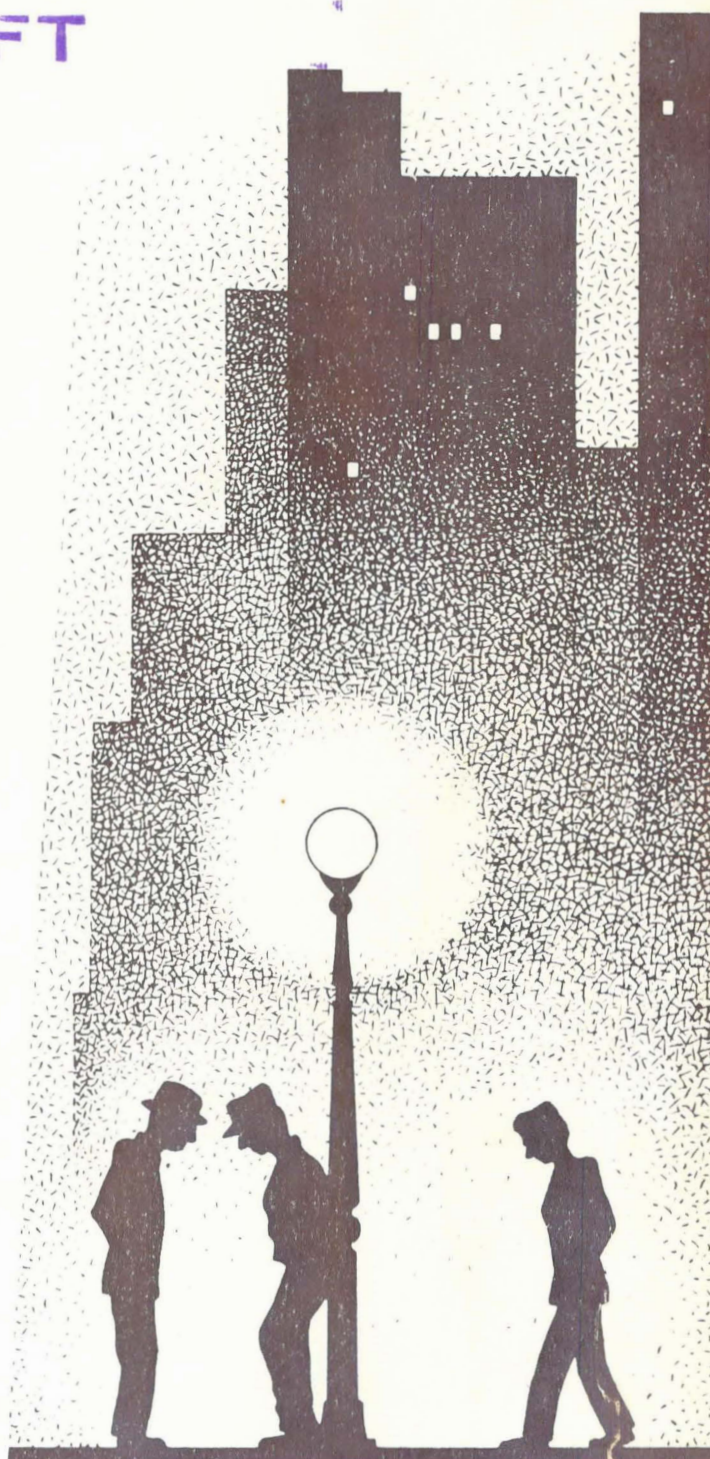


FOREST RECREATION RESEARCH IN AN INTERMETROPOLITAN REGION

REVIEW
DRAFT



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REVIEW DRAFT

HIGHLIGHTS

The purpose of this report is to select problems for the Forest Recreation Research Program in the Northeast. This is a regional project of the Northeastern Forest Experiment Station for conduct of research in the 12 Northeastern States. It is located at the Forest Recreation and Wildlife Laboratory near Warren, Pennsylvania.

The results of forest recreation research are needed for five purposes: (1) to develop concepts, methods, and techniques for further conduct of research, (2) to provide information for legislative action and broad regional planning, (3) to provide guides and classifications for the selection of land for recreation purposes, (4) to develop guides and use factors for the design and development of areas that have been previously set aside for recreation, and (5) to supply information that will assist managers in the day-to-day operation and protection of forest recreation resources and installations.

Priority of importance of research problems is different for each of the above needs. No single priority can be considered to be "correct". The priority of the problems listed is selected because the project is resource-oriented.

A research problem is defined as a substantial part of the field of study. It is large enough and important enough to claim the full attention of one or more scientists.

PROBLEMS

1. The natural landscape.--What methods of managing the forest landscape will provide for the greatest welfare and satisfaction for the visitor seeking recreation in the forest, for the best allocation of the recreation resource and the greatest protection of the forest at least cost?

2. The developed resources.--What type, amount, distribution, and combination of structures will provide the people with the best access to the forest, with health, safety, and with enjoyment of the forest environment consonant with protection of the forest and reasonable cost?

3. Estimating present use and demand.--How may useful estimates be made of the present volume, type, and distribution of the employment of the forest recreation resources and of the preferences of people for the various resources, activities, and facilities?

4. Predicting future recreation demand.--What social and economic forces are at work in Metropolitan Centers that will influence recreation in the surrounding regions, and when and to what extent will these forces begin to exert pressure upon the forest recreation resources?

5. Financial aspects.--What are the costs and returns from the various types and sizes of forest recreation installations in relation to their organization, management practices, location, and other factors affecting financial efficiency?

6. Evaluation of social and economic benefits of the use of forest resources for recreation.--How may forest recreation values be determined and compared to other uses of multiple-use forests or singly against specific, competing uses for land?

Problems selected.--For the research for the immediate future, problems selected include:

- (1) The natural landscape,
- (2) The developed resources, and
- (3) Estimating present use and demand.

October 1, 1963

FOREST RECREATION IN AN INTERMETROPOLITAN REGION

A Selection of Problems
For Forest Recreation Research
In the 12 Northeastern States

by

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INTRODUCTION

Project Base.--This is the problem selection for forest recreation research in the Northeast. The object of this project is:

To provide guides to planning, improving, protecting, and managing forest recreation facilities: these studies of the physical, social, and economic aspects of recreation problems--also through evaluation of these problems as they are related to other uses of the forest.^{1/}

^{1/}From U. S. Dept. of Agr. Line Project Description of Research Project FS-NE-1901, Forest Recreation Research in the Northeast.

History.--Research in forest recreation in the Northeast was started by the Forest Service in 1959 in response to the very great and continuing increase in forest recreation which began after World War II. This research program was based upon a nationwide analysis of forest recreation in the United States made in 1957 by Dean Dana of the University of Michigan (Dana 1957)^{2/} and upon a preliminary analysis by the

^{2/} Names and dates in parentheses refer to literature cited.

Northeastern Forest Experiment Station (Lane 1959).

Need for Recreation Research.--The necessity for intensifying forest recreation research is implied in "An Evaluation of Agricultural Research" (U.S.D.A. 1960). Although the following excerpts from that report were not all applied to forest recreation in the original text, it is reasonable to assume that recreation is within the policy stated.

To serve the needs of consumers and to point the way to profitable adjustments in agriculture, research is needed to determine the kinds and to define the qualities and quantities of the various agricultural products that people need and want, to delineate the factors influencing demand. Needs and wants of consumers involve both physiological requirements and the tastes or preferences that reflect economic and psychological situations conditioned by the social environment. Agricultural research should therefore include investigations into the consumption and use of the many kinds and forms of agriculture and competitive products, and consumer

attitudes toward them. Such information is needed in terms of...segments of the population classified by region, degree of urbanization, income, age, education level, and such other characteristics as may affect consumption levels or influence choices... Research to delineate present patterns of consumption of all goods and services and to understand the factors affecting them, also needs much strengthening, especially through information gathered directly from consuming units. The implications of such data both for agriculture and for the general welfare of the public should be analyzed... There is practically no research on the problems of rapidly expanding forest recreation.

Recreation had been an important but rather casual forest use and, up until a few years ago, little research had been done and next to nothing had been published. But within the past few years, many people have been studying and publishing on recreation; and with the release of the tidal wave of information contained in the report of the Outdoor Recreation Resources Review Commission (1962) with its 27 study reports, there is more than adequate information available from which to select problems for a research program.

The purpose of this analysis is to select problems that will form the basis for the research program of the Northeastern Forest Experiment Station's project "Forest Recreation in the Northeast."

Definition of a Problem.--As used here, a problem is a substantial part of the field of study. It is large and important enough to claim the full attention of one or more scientists. Each problem is worthy of a separate program of studies.

PROCEDURE USED FOR ANALYSIS
PROBLEM SELECTION, AND CLASSIFICATION

Analysis.--The selection of research problems started from the point of trying to estimate the demand for recreation in relation to forest recreation resources available or, in other words, to find a means for estimating the probable success of a forest recreation enterprise, public or private, in a given locality. This approach appeared to be logical because so many communities and individuals are looking to recreation as a means of bringing in "outside" money. Although it is true that there is a large and increasing demand for outdoor recreation, many who put their hopes for increased prosperity through recreation development may be disappointed.

When searching for factors which may lead to success in recreation, it is necessary to consider not only the local population both rural and urban but also the influence of the great metropolitan complexes which dominate the Northeastern region.

The Northeast can be divided into three different kinds of recreation regions based upon these metropolitan complexes. The recreation regions are the "Metropolitan Center" which, in most instances, is a Standard Metropolitan Statistical Area, the "Metropolitan Recreation Region" which is a wide irregular band surrounding the Metropolitan Center; and beyond this lies the "Vacation Region."

Metropolitan Centers.--Metropolitan Centers would be of little concern to Forest Recreation Research if their problems did not spill over into surrounding regions. Although some of the results of forest recreation research may find application in the park systems of Metropolitan Centers, recreation there is not dependent upon a forest environment and thus is beyond the scope of forest recreation research. But it is important that scientists studying forest recreation keep in close liaison with those studying urban populations and their recreation needs in order to predict the future volume and types of forest recreation demand that will have their sources in the Metropolitan Centers.

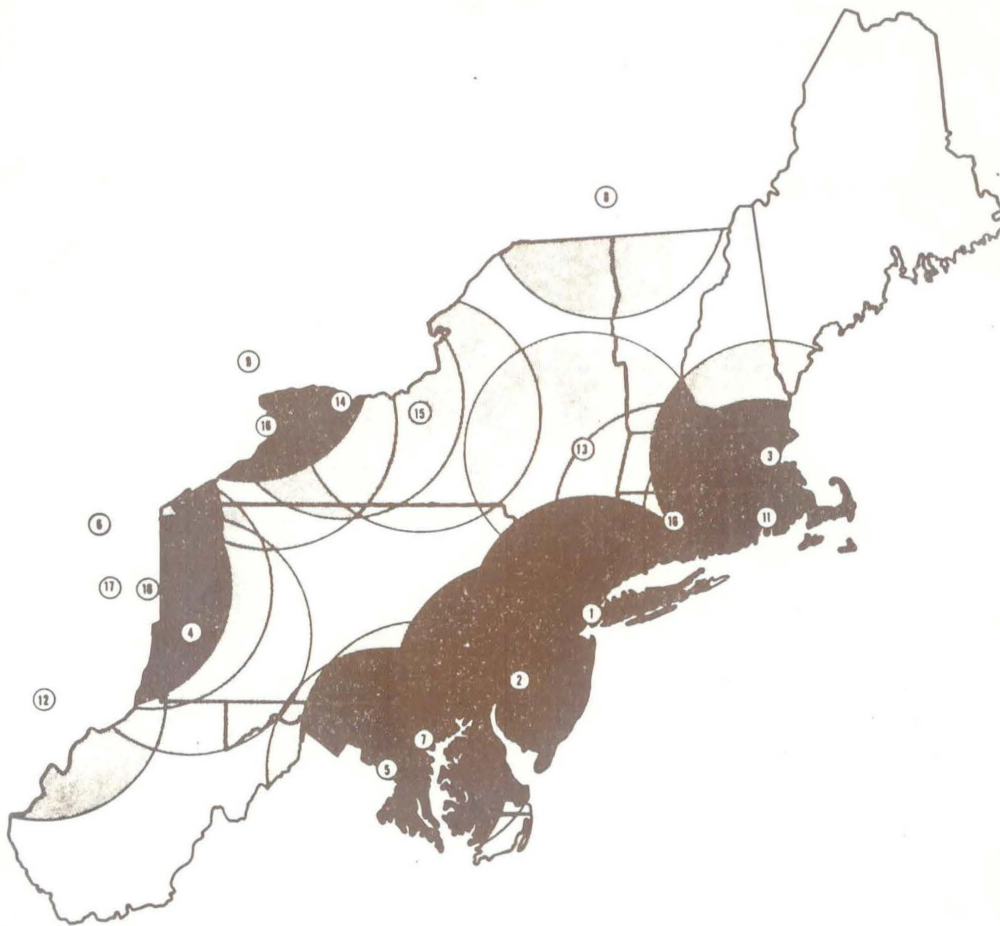
Metropolitan Recreation Regions.--The Metropolitan Recreation Region begins within the close environs of the city and extends beyond the rural-urban fringe to a distance which can be readily traveled in a day's outing or in an overnight trip. Such a region reaches octopus-like arms along the highway networks with the arms considerably extended along high-speed, limited-access highways, Fig 1. When large cities are close together, as in the Northeast, these extending arms overlap in a bewildering manner; so an arbitrary circle with a 100-mile radius (roughly a 3-hour drive) is used here to illustrate the Metropolitan Recreation Regions, Fig 2.

A complicated network of problems of water supply, transportation, need for space, social changes and other forces



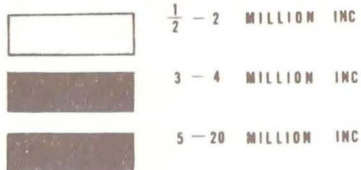
Fig 1.--The Metropolitan Recreation Region begins within the close environs of the city and reaches along the highway networks into forested playland.

METROPOLITAN RECREATION REGIONS OF THE NORTHEAST



LEGEND

AREAS WITHIN 100 MILES OF
POPULATION CONCENTRATIONS OF:



STANDARD METROPOLITAN STATISTICAL AREAS 1960

- | | | | |
|--|----------------------------|---------------------------------------|-------------------|
| ① NEW YORK
NEWARK - JERSEY CITY
PATTERSON - CLIFTON
PASSAIC - N J | ④ PITTSBURGH PA | ⑨ TORONTO CANADA | ⑭ ROCHESTER N.Y. |
| ② PHILADELPHIA - PA - N J | ⑤ WASHINGTON D C - MD - VA | ⑩ BUFFALO N Y | ⑮ SYRACUSE N.Y. |
| ③ BOSTON MASS | ⑥ CLEVELAND OHIO | ⑪ PROVIDENCE - PAWTUCKET
RI - MASS | ⑯ HARTFORD CONN |
| | ⑦ BALTIMORE MD | ⑫ COLUMBUS OHIO | ⑰ AKRON OHIO |
| | ⑧ MONTREAL CANADA | ⑬ ALBANY - SCHENECTADY
TROY N Y | ⑱ YOUNGSTOWN OHIO |

extends from the Metropolitan Centers. Forest recreation may seem to have no relationship to these forces, but they do exert influences upon both recreation lands and types of recreation development.

Of the Metropolitan Recreation Region the ORRRC Study Report 21 (ORRRC 1962) states:

In spite of some variations as to its extent, all of these studies of the recreation of metropolitan residents tend to identify for each metropolitan center a corresponding metropolitan recreation region. This region and its recreation resources provide a large proportion of the total recreation activity of the metropolitan center. If satisfactory resources for recreation can be made available in this area, then a considerable part of the recreation "problem" of Metropolitan Centers would be solved...

Because of the pressures of population, the communities within and near large Metropolitan Centers may have forest recreation values and problems very different from those areas which are more remote. For example, in remote areas the decision on whether or not to set aside certain forest lands for recreation probably would require studies of recreation versus timber values; whereas, within a Metropolitan Recreation Region, it is quite likely that the alternatives would be between recreation and more intensive uses, such as: industrial sites, housing developments, or perhaps a cemetery. The tendency for highways and other rights-of-way to gravitate

toward "open" or "unused," i.e., recreation lands are increased as the Metropolitan Center is approached.

In the Northeast, only northern New England, a portion of the Adirondacks, a small area in central Pennsylvania and another in West Virginia are outside of Metropolitan Recreation Regions; these areas make up the "Vacation Regions."

Vacation Regions.--Although most of the research problems found in the Vacation Regions will be paralleled in the Metropolitan Recreation Regions, the reverse is not necessarily true. Distance apparently prevents the lower income visitors from traveling to the "Vacation Regions." The income of campers in the Vacation Regions has been found to be significantly greater than that of the general population (Shafer 1962)^{3/}

^{3/} Shafer, E. L. 1962. Unpublished office report on a study of the socio-economic characteristics of Adirondack campers; on file at the Northeastern Forest Experiment Station, Upper Darby, Pennsylvania.

(LaPage 1963)^{4/} The recreation demand in the "Vacation Regions"

^{4/} LaPage, W. F. 1963. Unpublished office report on a study of visitor motivation and attitudes toward forest recreation; on file at the Forest Recreation and Wildlife Laboratory, U.S. Forest Service, Warren, Pennsylvania.

may be more for camping than for other activities. The actual

relationships are not well known, although a relatively uniform demand for picnicking, swimming, and the like may be assumed from the local population within both regions.

Research problems are not considered separately for the three regions in this analysis, but the differences that occur between Metropolitan recreation regions and the Vacation Regions should be recognized in studies.

Levels of Planning.--Besides the spatial view of recreation which helps to divide problems into regions, it is also useful to consider the need for research results at four levels of application.

Requests for the results of recreation research come from those concerned with broad regional planning; for example, legislative committees, state planning boards, or groups representing several governmental levels such as basin planners.

A second demand for research results comes from those responsible for actual land selection. This selection may be done as a second step in regional planning, as in the Delaware (U.S. Army Engineers, 1962) and Potomac (U.S. Army Engineers, 1963) River Basin Reports, by a separate agency such as a state park board carrying out the mandates of legislative action or by foresters managing private, state, or federal lands, who may be trying to integrate recreation into their plans for forest management.

The third group seeking information is concerned with making the best possible use of a specific piece of landscape that has been previously designated for recreation use, either as one of the multiple uses of the forest or set aside primarily for recreation. Recreation staff men on forests and parks, landscape planners, and individuals hoping to develop a profitable recreation enterprise on their own property form this group.

The fourth group is made up of those who are now administering public or private recreation areas. Their concern is to improve management on an existing area, which may be in need of rehabilitation or which may need enlargement or reorganization in some manner to reduce costs, improve visitor enjoyment, or meet improved health and safety standards.

These four levels of planning and operation are not always distinct. Properly, they should be distinct as to time, because regional planning should precede the selection of land, selection must precede development and development precedes operation. But, in practice, lands are often set aside for recreation and developed with no thought of fitting them into a regional plan of recreation.

There is an additional need for research results within research itself for further development of methods, techniques, and concepts useful to the conduct and improvement of research methods.

PROBLEMS OF RECREATION RESOURCE PROTECTION AND MANAGEMENT

The recreation resource includes both the natural landscape with its intrinsic recreation values and the man-made facilities which make the natural landscape accessible or enjoyable. The natural landscape includes: lakes, streams, mountains, meadows, forests, swamps and other natural formations, as well as the game and fish, small animals, birds and insects that inhabit them. Facilities include in part: roads, trails, paths, swimming beaches, boat landings, observation platforms, overlooks, winter sports areas, shelters, campsites, water systems, sanitary systems, and visitor information services.

The Natural Landscape

Problem: What methods of managing the forest landscape will provide for the greatest welfare and satisfaction for the visitor seeking recreation in the forest, for the best allocation of the recreation resource and the greatest protection of the forest at least cost?

Land use classification for recreation.--There are a number of physical and biological factors, which, when found in proper combination, result in ideal recreation areas. For skiing, the physical factors would predominate because topography

and snow cover take priority over other factors. For hunting, the combination of physical and biological factors provide suitable habitat for game; for boating, the need is for access to relatively large bodies of water.

The ORRRC has developed a classification for recreation resources which provides a sound base. However, over 90 percent of the forest lands in the Northeast would fall in Class III, ORRRC (1962). Additional information is needed to provide closer estimates of the recreation potential of given areas in terms comparable to other recreation opportunities which may either supplement or compete with them.

Several classifications and studies that contribute to recreation land classification have been made (ORRRC Study 8 1962), (U. S. Soil Conservation Service 1954), (Dill 1960), (Colwell 1950) and Roger W. Rich. ^{5/} A more recent recreation classification has

^{5/} Rich, Roger W. 1961. The evaluation of forest types as game habitat in Massachusetts, Unpublished Masters Thesis Univ. of Mass. Dept. of Forestry and Wildlife Management, Amherst, Massachusetts.

been made by Lewis and Oertel (1963) in which they analyzed both soil and perceptual surveys. This method was used in the excellent recreation plan for Wisconsin (1962). Studies of this type should be pursued for the Northeast with the relationships to population centers and transportation networks peculiar to the Northeast being considered.

There are a number of people who could render sound judgment on the capability of recreation lands; but after they had finished, commonly understood terms for communication of their verdict would still be lacking. The best example of the usefulness of such a classification is the Land Use Capability Classification developed by the Soil Conservation Service (1954) for agricultural land use. Before that classification was established, there were many who knew a good farm and could describe one; but land use classification provided a meaningful way of grouping a number of physical and biological factors and a means of communicating the sum of these factors.

This classification would not involve research in the sense of experiments, data collection, and analysis; but it would be useful research of an empirical nature. There is a real need for a classification that is recognized as sound and that can be easily understood and used both as a guide for broad recreation planning and for the preliminary stages of land selection and acquisition.

Although there are considerable amounts of land relatively close to most Northeastern cities that could be used for recreation, it is by no means all first-class recreation land. Much of this land may have possibilities for recreation development that would not be recognized without a systematic means of assessing recreation land values.

Multiple use.--The increasing need for recreation in no way decreases the need for other forest products. Other forest uses should continue on recreation areas wherever feasible, except on areas set aside for primitive or wilderness use.

Harvest cutting of timber has been denounced by total preservationists in terms of such indignation and outrage that the benefits to recreation from heavy harvest or even clear-cutting in terms of variation in the forest canopy, wildlife survival, and distribution; and the establishment of vistas frequently has been overlooked.

Providing for recreation in timber management.--Many foresters on both public and private lands are attempting to preserve scenic strips along roads or canoe trails or to preserve recreation values on large tracts that have high recreation use. There is a pressing need for "recreation" timber marking guides. Experimental cuttings should be made to develop guides for the manipulation of timber stands to secure the greatest esthetic values along scenic strips. Fig 3. For example, in the northern hardwoods, provision could be made for leaving birch and clumps of fir and spruce where the birch would furnish highlights to the landscape and the conifers the more sombre tones. Where roads pass through maple stands, consideration could be given to fall foliage colors. If properly done, the stand could be harvested, esthetic values could be enhanced, and the



Fig 3.--Timber cutting to enhance and preserve the greatest scenic values should be practiced on some areas. (Photo by courtesy of New York State Department of Conservation).

waste and monotony of a totally protected strip along the road would be avoided. There is as much art as science in this special type of cutting; therefore, foresters should team with landscape architects in working out marking rules that would achieve timber harvest and enhancement of esthetic values at the same time. In some areas, cutting may not enhance esthetic values; in those instances, procedures that would result in the least damage to such values consonant with the primary management objectives might be sought.

Another special type of timber harvest connected with recreation areas needs to be developed to remove timber from campgrounds, picnic areas, and the like. Perhaps all-aged stands should be developed and trees removed just before physiological deterioration begins, (Wagener 1963). In a properly managed area the trees removed would keep the canopy open enough for a pleasant recreation environment and still have enough healthy large trees for shade and beauty.

Selected trees for recreation areas.--Management of vegetation for recreation should consider trees developed by arboriculture that have desirable characteristics. Such trees may have many advantages on heavy-use areas. They might be used to get quick shade where needed. Some of these species may be more resistant to soil compaction than native trees. In this instance, research would be confined to adaptation tests.

Revegetation of areas that have deteriorated.--Many of the very best recreation locations have been in use for many years and some have deteriorated seriously. In some places, both the forest canopy and the understory plants have been seriously damaged. Studies should be made to learn the best means of rehabilitating both forest and understory.

Reestablishment of plant cover alone would be insufficient. Along with such restoration, there must be some means developed for maintaining the restored trees and understory. This may be done by cleverly contrived patterns of planting that would reduce trampling by guiding the visitors onto paths which could be inconspicuously reinforced.

Criteria for uniform evaluation of deterioration.--FBrest landowners and administrators also wish to know the kinds of physical wear and damage that can be expected as the result of recreation. Some recreation administrators might say that they have all kinds and degrees of damage. However, the situation usually is not that bad; the abundant rainfall in the Northeast allows fairly rapid recovery of vegetation, and the compaction of soil is reduced by frost heave to some extent. Because of these factors, many recreation areas in the Northeast have a good grass cover under levels of use that would cause very heavy deterioration in the more arid portions of the country (Magill and Nord 1963). This does not imply that the problems of soil compaction, soil erosion, dust abatement, vegetation durability, and site rehabilitation are unimportant in the Northeast.

Deterioration here may be less easy to see, but the heavy use that is experienced makes it very important that such deterioration be measured and that means of recognizing potential damage and preventing it be developed. Some evidences of deterioration have been observed which apparently had their root in a too great desire to keep the area "natural" as long as possible. The result of a lack of timely reinforcing led to deterioration and repair, which can be much less attractive than modest preventive measures installed at the outset.

Physical factors of the soil: Recreation impact can be related to physical factors of the soil and to the density of tree cover (Ripley 1962). Further studies of this type are desirable. Equations for estimating the durability of vegetation under recreation use have been developed by Wagar (1961).

The planning of recreation areas could be improved and eventual protection and maintenance costs reduced if the planners were furnished information on the characteristics of the various soils in relation to recreation use.

A field-key relating soil characteristics to levels of development might be useful (Wisconsin 1963). From the many characteristics used in classifying soil, it might be that one or two physical factors might stand out as far more significant than others as is the case of soil texture in trafficability for vehicles (Carlson and Horton, 1959). The application of these findings could be applied to a wide variety of soils through a

summarization of physical factors of the soil (Broadfoot and Burke, 1958). Other approaches might be similar to those used by Doolittle, (1957) in developing site indexes for timber purposes or in the recreation impact studies by LaPage (1962). Both ecologists and soil scientists should be involved in studies of this problem.

Vegetation at the water's edge.--Preliminary observations have indicated that some people prefer grass to sand beaches.^{6/}

^{6/} Burke, Hubert D. 1961. Mapping Utilization of Recreation Areas. An unpublished office report on file at the Forest Recreation and Wildlife Laboratory, Warren, Pa. March 1961.

Study should be made to determine the best means of establishing and maintaining a desirable turf beach. Such studies may consist primarily of adapting present turf practice to swimming sites in forest recreation areas.

Turbidity caused by water-growing plants often reduces the attractiveness of a forest swimming area. Where this occurs, some study should be made of a means of reducing the nuisance.

Rehabilitation of streambanks and shores of lakes and artificial impoundments is also in need of study. These areas are subject to heavy use and sometimes to fluctuating water levels which destroy much of the beauty of the water's edge.

Pollution. --If city governing bodies and water companies could be assured that recreation use was not harmful to water supplies and that epidemics of typhoid or other water-born diseases would not break through the safeguards, much additional land close to Metropolitan Centers could be used for recreation. This problem involves soil erosion which may raise turbidity of water, human excrement, oil, or other refuse that would pollute the water.

As with many of the other problems, a team of scientists should study this problem. Some municipal reservoirs and watersheds are now being used successfully for recreation. These and the causes of pollution on such areas should be carefully studied and the control measures reduced to guidelines.

There are special problems of soil, subsoil, drainage, and weather patterns that would affect pollution in relation to recreation use, and specific studies of various types of areas would be needed. This study should involve ecologists, soils scientists, hydrologists, engineers, and the cooperation of medical and public health scientists as well.

Conservation literature is replete with discussions of the wide distribution and serious consequences of both biological and chemical pollution of streams. The importance of pollutions in the Northeast has been reported in detail in two river basin reports (U.S. Army Engineers 1962,1963). No further discussion is needed here to emphasize the condition. The problem for

recreation is how to obtain sufficient amelioration to make added water areas available for various activities. Studies are now being made in relation to fishing; but boating, swimming, and even picnicking and camping are affected by pollution. Many agencies are concerned with pollution abatement, and for many reasons it is also a major problem in recreation. It may be that but few original studies would be needed on this problem; however, the problem should be recognized and a careful compilation of applicable research made. Only then would the necessity for original study become apparent.

Insects.--Insects frequently are pests in camping areas. Some manipulation of vegetation to reduce this nuisance might be suitable.

Animal cover.--The sight of animals, even garbage-eating bears or marauding raccoons, is one of the pleasures of forest recreation. Some study should be made of trees or shrubs, or groupings that attract birds and both small and large animals. These wildlife-viewing areas should be determined so that plans could include such grouping in and near recreation areas, particularly camping and picnic areas.

The Developed Resources

Problem: What type, amount, distribution, and combination of structures will provide the people with the best access to the forest with health, safety, and with enjoyment of the forest environment consonant with protection of the forest and reasonable cost?

Man-made resources are important because they provide the means for traveling to and through the recreation landscape and for residing in or near it comfortably, safely, and enjoyably.

Among the large number of articles on outdoor recreation, the need for land and water space and for maintaining the quality of the recreation experience is constantly reiterated; however, in these articles singularly little attention has been paid to the corresponding need for improvement in visitor accommodations and recreation management practices.

The need for research into accommodations and for a people-oriented management policy was expressed by Pyles (1960):

...for our national forests of the Eastern region--we would hope to see... study directed at developing new and more scientific methods and techniques in the administration and care of outdoor recreation developments and use--similar in scope and detail to the techniques and methods now being applied in hotel management.

As more and more urban dwellers use the forests for recreation, the demand is for facilities that tend to "urbanize" the environment. In a study at Bear Brook State Park in New Hampshire, almost all expressions of satisfaction or dissatisfaction were in the direction for more creature comfort on the campground (LaPage).^{7/} Wagar (1963a)(1963b) reported

^{7/} LaPage, Wilbur F. 1962. Office report on the 1961 Bear Brook State Park Camper Survey in New Hampshire. On file at the Forest Recreation and Wildlife Laboratory, Warren, Pa.

similar findings in a study of recreation areas, in Pennsylvania and West Virginia.

In a study of campers reported by ORRRC (Study Report No. 5 ORRRC 1962) about two-thirds of the dissatisfied campers thought the areas were too crowded; the remainder complained of inadequate or dirty facilities.

Management and visitor accommodations have not received the research attention that they deserve; Dana (1957) pointed out the importance of this need in his problem analysis.

Design of areas.--Since the visitor comes to the recreation area in his automobile, brings his equipment, food and playthings in it, and often sleeps in it, the design of an area to accommodate automobile traffic and the amount and distribution of parking space are of primary importance.

Frequently, the most expensive part of a development is road and parking construction. Research is needed in road location and particularly in parking distribution. ^{Fig 3a} Frequently, parking is centralized for reasons of cost or for lack of information on proper distribution. On some areas people do not use the parking space provided unless expensive and often unsightly barriers are erected. Preliminary observations have shown that people prefer picnic tables within 150 feet of parking and seldom use a table more than 250 feet from parking.^{8/} A table in an exceptionally beautiful spot such as

^{8/} Burke, Hubert D. 1961 Office report "Mapping utilization of recreation areas at Chapman State Park, Pennsylvania. On file at the Forest Recreation and Wildlife Laboratory, U.S. Forest Service, Warren, Pa.

on a point of land at the edge of a lake might be an exception.

Overflow areas should be provided. Fig 4. It is costly to construct a recreation area to fully accommodate the peak loads of Memorial Day, Fourth of July, and Labor Day. On the other hand, some provision should be made to handle these peak crowds. Studies are needed to determine the type and size of the overflow and to guide the accommodation of these holiday crowds. Too frequently people are not accommodated at all or are shunted into unplanned overflow areas that have inadequate



Fig 3a.--Frequently parking area is less than the capacity of the recreation area. (Photo by courtesy of New York State Department of Conservation).

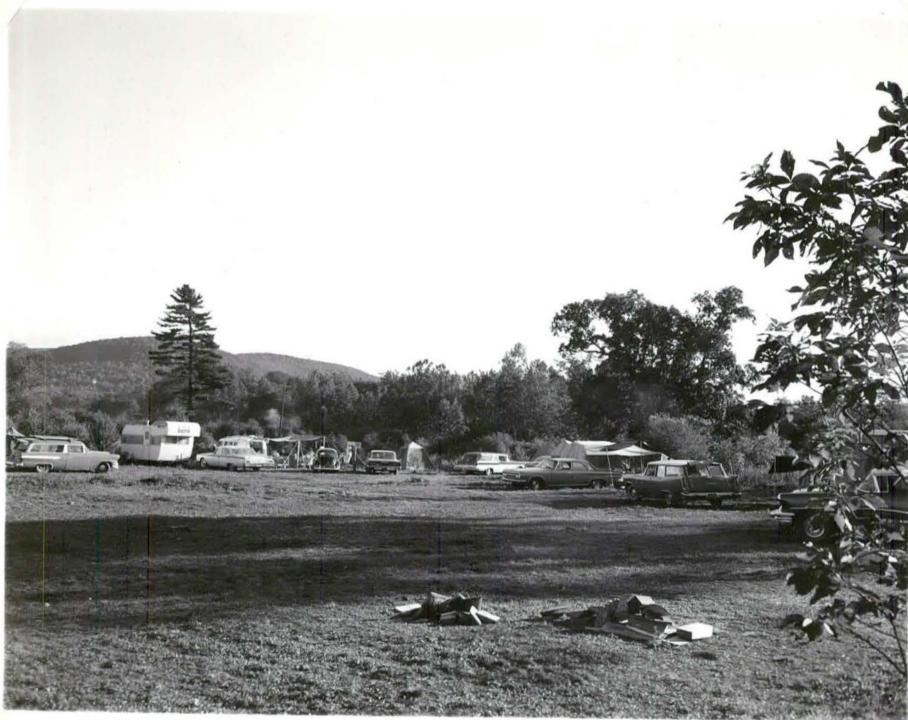


Fig 4.--Overflow areas are needed for holidays and long week-ends.

facilities. Such unplanned use often leads to severe deterioration of the soil and vegetation.

Somewhat similar to the overflow crowd but unlike it in many ways is the special-event crowd which may amount to several thousand people for a single day, but sometimes far more than that. Boating meets, cycle meets, archery contests, trailer caravans, and other such events may bring people to an area from many parts of the nation. Fig 5. The meet may not be held at an established camp, but the health and safety of the visitors as well as the forest environment must be protected. Such crowds are being provided for, but sometimes at the expense of badly littered and pitted areas. If not conducted properly, the marks of a single meet may persist for a season or more. Studies should be made of the minimum requirements of such groups for automobile parking, water supply, and sewage and garbage disposal.

Many recreation areas depend upon water for their setting and for a part of their activities. Fig 6. Swimming is one of the most important recreation activities. Construction and maintenance of swimming beaches usually are very expensive. This is particularly true for improvement where an artificial beach must be constructed. Sand must be brought in. Wind and water erode the sand, and mud works up through the sand at the edge



Fig 5.--Hundreds of people gather for special events, frequently in areas with no facilities for handling such crowds. (Photo by Courtesy of the New York State Department of Conservation).



Fig 4.--Overflow areas are needed for holidays and long week-ends.

of the water--in the wading area. Studies are needed to devise relatively low-cost methods of beach construction which would provide a stable and clean swimming area.

Studies of the preference for grass versus sand beaches should also be made. Preliminary observations indicate that it might be possible to reduce the expensive sand beach considerably in favor of turf beach.^{9/}

^{9/} Ibid.

More information is needed for the layout, maintenance, costs, and capacity of hiking trails. Hiking is a form of recreation use that would require the very minimum diminution of the other uses of the forest and is capable of providing some of the best in user satisfaction. The studies should also consider cycling trails, the possibility of using old road or railroad beds, and of combining hiking and cycling on the same trails. Suitable distances and routes for different types of visitors should be considered in the preparation of guides for such recreation. Cycling may be a good activity for the inner portion of the Metropolitan Recreation Regions.

Marked trails for hunters should also be tested. Hunters frequently do not leave the vicinity of roads. This is presumed to be because they are fearful of becoming lost. More recreation satisfaction, a more uniform game kill, and less lost hunters might result from a well-developed and tested trail system.

Camping and picnic grounds have received the bulk of the recreation research to date. One publication lists over 900 studies in the field of camping and education (van der Smissen 1962). Yet, most camp and picnic grounds are laid out by rule-of thumb rather than on research findings.

Some agencies use a space factor of 3 campsites per acre and some 14 per acre. There are spacings which are acceptable to many people but which would destroy a natural site. On the other hand, there are means of reinforcing sites so that they can support heavy concentrations. Such reinforcement and concentration of people might be very distasteful to a few; yet, larger numbers of people might be accommodated by such means in a manner quite acceptable to them. In the Northeast this is very important because of the small amount of recreation space available and large numbers of people. Studies are needed on the "social" carrying capacity as well as on the biological carrying capacity of such areas. If the social capacity exceeds the biological, the area could be reinforced or the number of visitors limited. Studies are also needed to determine the means of reinforcing such areas without too great a loss of aesthetic values.

Accommodations for the rapidly increasing numbers of travel trailers and auto-campers should also be studied. The development of special areas for "independent" or "self-contained"

trailers might provide for many additional forest recreationists at relatively low cost since "independent" units have their own facilities (Mobile Homes Mfg. Assoc. 1963).

Other planning factors are also needed to guide design. These include average daily requirements for water: boating space, swimming space, parking space, and water skiing space. A swimming installation with space for 1200 people should not be limited by parking space for but 800. Perhaps the number of boats allowed per acre of water might be worth studying as a means of improving safety.

Garbage and sewage disposal.--Sewage, garbage, and waste water disposal are real problems, expensive ones, and ones which have much more to do with the satisfaction of the users than many of the more ethereal or sophisticated researches that are more acceptable to learned discussion. We have already had an outstanding example of this; Wagar (1962) developed and tested a flame-actuated convection stack for removing odors from pit toilets--which works. We have done other studies on means of estimating carrying capacity, on visitor motivation, and on economic levels of user groups; yet, the expressed interest of managers of city, county, state, and other recreation areas has been many times greater for the toilet stack than for all other studies combined.

The Taft Center in Ohio ^{10/} is doing a great deal of work

^{10/} Towne, W. W. and H. R. Pahren. Use of stabilization ponds in treating sewage and industrial wastes. A paper presented at the 8th Municipal and Industrial Waste Conference, Chapel Hill, North Carolina, April 2 and 3, 1959.

on sewage disposal, and a host of gadgeteers have worked on both toilets and on garbage disposal; yet, satisfactory means for disposing of sewage and garbage are still not in general use, and the reaction of the user to various garbage and waste water disposal systems has not been studied to date.

A careful review is needed and empirical studies should be made to test some of the many commercial offerings in this field as well as ideas which have been advanced in Grist, Park Design, ^{11/} and the various park and landscape publications.

^{11/} Publications of The National Conference on State Parks in cooperation with The National Park Service, Washington, D. C.

Facilities tests.--The management of recreation areas is inextricably enmeshed with the furniture of recreation; such as: boat launching ramps, tables, gates, barriers, signs, and the other facilities necessary for operation.

There are many designs for most facilities, and many more are being added because this is a fertile field for gadgeteers. Gadgeteering, as a rule, is not a part of recreation research; but the selection and testing of designs to determine their relative efficiency, acceptability to the public, or cost is necessary and is proper work for research.

PROBLEMS OF RECREATION RESOURCE USE

The problems of recreation resource use are concerned with people rather than with soil, trees, grass, water, and wildlife with which forest research has been familiar. Some contacts with the desires of people have been made in wood marketing and other forest economic studies. Problems of the recreation resource are, for the most part, but variations of existing resource problems and, when identified, could perhaps be best investigated by forest scientists already familiar with the methodology and with the vegetation and soil types on which the problems occur.

Recreation resource use, on the other hand, requires a new dimension in forest study. This type of study is somewhat new to forest research in that it involves people; it is also somewhat unfamiliar to social scientists because their work has rarely included study of people in the forest environment. Most social studies have been directed, quite properly, to situations where concentrations of people have been faced with problems such as: school, military service, urban crowding, or other social tensions.

The study of the use of the forest recreation resources can be separated into four problems:

Estimating present use and demand,

Predicting future demand,

Financial aspects of organization and management for recreation, and

Evaluation of costs and benefits of the use of forest resources for recreation.

Estimating Present Use and Demand

How may useful estimates be made of the present volume, type, and distribution of the employment of the forest recreation resources and of the preferences of the people for various resources, activities, and facilities?

There has been no significant improvement in methodology for the determination of recreation use since Dana (1957) made the following comment: "...a first step is to determine the present use of existing facilities. Here again much information is available, but it is by no means complete and in many cases its accuracy is open to question."

An adequate determination of recreation use must include:

- (1) A count of the visitors, (2) a measure of their preferences, (3) an assessment of the information and education desired by them to assist in their enjoyment of recreation use, (4) a study of organization and personnel relationships within the agencies providing recreation as they affect the use and preferences of visitors, and (5) some measure of the preferences and attitudes of people as they are reflected in destructive practices.

Counting the visitors.--Some research is currently under way to improve visitor counts. James and Ripley (1963) have developed methods of sampling recreation populations and of estimating the number of visitors at individual recreation sites based upon traffic counter data. Wagar 12/ developed a

12/ Wagar, Alan 1961. Sampling unsupervised campgrounds on the White Mountain National Forest. Unpublished manuscript on file at the Northeastern Forest Experiment Station, Upper Darby, Pa.

method of estimating the number of people using unsupervised campgrounds by relating this use to the number of people using supervised campgrounds nearby. Further study in this direction is essential. This type of study should be expanded to determine if usable relationships can be discovered between traffic counts in the major highway pattern and recreation use at specified points, Fig 7.

Studies of methods of counting visits to wilderness areas by means of ~~unmanned~~ registration stations are being made in the Pacific Northwest.13/

13/ Gregersen, Hans M. 1962. A Study Plan to determine how unmanned-registration-station data can be calibrated to effectively and efficiently measure use of wilderness-type areas. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.



Fig 7.--A correlation between recreation demand and traffic counts on highways leading into recreation is needed.

Mechanical devices can be used to provide estimates of the total number of visits, but this information does not separate repeat visitors from those who may visit but once or perhaps once a season. Rich ^{14/} has found that rather well-

^{14/} Rich, Roger W. Distance traveled and recreation use in the Northeast. Unpublished manuscript, Northeastern Forest Experiment Station, 1963.

defined patterns of visitor origin exist in the Northeast, where the proportion of repeat visitation is relatively constant for each recreation area; but the proportions vary widely from area to area as do the differences in distance traveled by the repeat visitors. It may be that the results of such studies could be combined with highway counts to provide estimates of the origin of the users.

In order to avoid some of the problems presented in use of questionnaires, exploratory work, using direct observation, has been done. ^{15/} If properly applied, direct observation

^{15/} Burke, Hubert D. 1963. Distance from parking determines picnic table use. Unpublished manuscript on file at the Forest Recreation and Wildlife Laboratory, Warren, Pa.

methods can define the areas and types of facilities most used as well as provide some indication of the surroundings most desired and trends in use that may occur with weather change

and time of day.

Because all of these methods record participants only, the results are biased because such studies are essentially an analysis of an affirmative vote. The negative vote has stayed away. This situation is complicated further because the negative and the "not interested" vote are not separated.

Questionnaires, if limited in their use to participants as is done with observations, have essentially the same limitations. However, any sound evaluation of present use should take some account of non-use. Questionnaires are needed to make this accounting. It may be that a portion of such information could be obtained through the insertion of recreation questions into the regional or national survey research studies.

Determining visitor preference.--One of the important tasks of management is to learn the extent that objectives of the operation are being achieved. In recreation, the objective is visitor satisfaction within the limits set by wise use of the land. An important part of research is to develop sound methods that can be used by administrators for determining visitor satisfaction. The methods should be simple and easy to operate so that administrators could and would use them. After developing the methods, procedures need to be developed for operation of the surveys, and it may be necessary in the beginning for research to lay out sampling plans for administrators.

A satisfactory evaluation of recreation use should include the kind of recreation wanted. At present, campgrounds, picnic grounds, and most other outdoor recreation installations are more or less standard throughout the nation. Provision for recreation are much more uniform than the climates, the topography, or the cultural patterns of the people (Wisconsin 1963). The differences that these factors have upon demand should be assessed.

This means that recreation planning must adopt a market-oriented approach, to find out what its consumers want now and what they are likely to accept in the ways of as yet untried facilities. The first is easily done, but the latter requires experiments with innovations in order to see whether or not they will be accepted. Also, like other market-oriented agencies, recreation planners must restrain themselves from giving people what they clearly do not want, even though the planner may feel strongly that they should want what he wishes to provide. (Gans 1962)

In regard to kinds of recreation desired, Webber (1962) says:

Many of the underprivileged ethnic and racial minority groups living in the centers of large cities have not yet come to share fully in the dominant cultural traditions; and activities such as camping, hiking, and hunting may have no personal meaning for them. Their preferred outdoor recreation takes more urban forms: sports, swimming, and the organized activities conducted in amusement parks, beaches and resorts.

These recreation activities are as integral to their subcultures as wilderness-oriented activities are to the vernacular culture. Successful participation in a baseball game may contribute more to one person's sense of personal achievement and to his self-identification than scaling a mountain may for someone else.

For each, the aspirations and the sanctions of his own social group establish the criteria for personal achievement and personal gratification and set the framework for personality adjustment. Each type of outdoor recreation has validity and importance, then, only as the individual views it within his own social context.

Certainly no mean part of this social context is the shaping and molding effects of past experiences upon present satisfactions. In assaying the satisfaction obtained from a given recreational experience, it would be no less than callous to ignore the variability in recreationists' past behavior and its meaning to them. In one study of camper satisfaction (LaPage 1962, The Bear Brook State Park Camper Survey, Office Report) a strong and persistent negative relationship was found to occur between the extent of past camping experience and the degree of present camping satisfaction.

Previous recreational experience is only one of a great many modifying influences, however. And, it is a compound variable at that, which fails to take into account the dynamics of experience, the camper's former roles, his awareness of the experience, his changing social needs, and the interpersonal contacts of each experience.

Weber (1962) elaborates further upon these problems:

Some of the differences in perception among members of different social groups are extremely subtle and therefore difficult to identify. For example, some recent research suggests that perceptions of the physical environment reflect the structure of one's social environment. Among certain ethnic groups of low status and low income, the organization of social relationships is quite rigid; individuals' roles, responsibilities, and prerogatives are clearly defined and mutually understood. The physical counterpart is a rigidly organized spatial environment. Individuals appear to experience greater psychic comfort when they are physically close to large numbers of others who share the social norms and where the placement of buildings, roads, and other facilities is also clearly structured, readily comprehended, and compact. This stands in marked contrast to the more flexible character of middle-class society and to the suburban and semi-rural physical environments which middle-class populations seem to prefer. Where members of one group would find spiritual meaning and recreation enjoyment in a wilderness setting, others would find such an unstructured environment without meaning and a potential source of strong personal, psychic discomfort. It is apparent that the designers of outdoor recreation facilities must sensitively provide for a wide range of physical environments, ranging from virgin wilderness areas to Coney Islands, each adapted to the perceptual systems of the various population groups.

Specific answers are needed to such questions as: How many and what kind of recreation areas are needed at present in Western Pennsylvania, in the Catskills, and in the Monongehela National Forest? For any given area, how many campsites are needed, how many picnic sites, to what capacity should the beach and bathhouse be built, and how many more hiking or cycling trails would be used now if they were available.

Fine and Werner (1960) conducted a series of studies of the use of the Wisconsin vacation region. These studies included estimates of use made by the people from the relatively distant Metropolitan centers of Chicago and Minneapolis-St. Paul. Studies are needed that would test the effect of distance from population centers upon existing recreation demand. For example, what is the difference in demand at the same distance from metropolitan centers of 4 million, 8 million, or 16 million? Can these demands be related to the population of the metropolitan centers, to automobile ownership, or perhaps to the capacity of highway systems? If the latter could be used, a ceiling of demand could be estimated in each direction from a population center based upon highway capacity and recreation development could be predicted to some extent from the highway building program. The origin of visitors may be different for different recreation activities in the same region; for example, skiers, hikers, and picnickers in the White Mountains may come from altogether different social groups and geographic sources.

The composition of the full spectrum of recreation now desired and the proportions of each activity demanded within this spectrum should be determined.

Studies should be made to provide better methods for determining conflicts in recreation demand, of seasonal changes in demand in relation to weather, of the effects of preceeding weather on attendance, and of the effects of intervening

recreation opportunities upon demand at specific areas.

Improved methods are needed for estimation of the various recreation demands. Gravity models offer some advantages. Such models could consider travel time to the visitor sources, number and kind of recreation activities, and other variables that would be useful in gaining a concept of use and demand. Perhaps some of the methods used by sociologists for studying labor and other forms of population dynamics would be helpful (Stouffer 1962) (Huff 1963) and (Isard 1960).

Informing the visitor.--Among working men and women there is an increasing tendency toward specialization--to be a cutter, a molder, or a trimmer. Along with specialization there appears to be a feeling that it is somehow immoral to work outside this primary skill. Without training, there might be a reluctance on the part of some to become a combined packer, fire builder, cook, tent pitcher, and all the varied skills demanded for competence in use of the out-of-doors. Concerning these people, Mead (1962) says:

As more and more people take vacations away from home, the increasing numbers will have two main characteristics. A larger proportion each year will be people who took no vacations at an earlier age and very often, depending of course on where they lived, failed to learn very basic skills like swimming, wielding an ax, using a jackknife, or baiting a hook,... For some time to come therefore, the need for very careful patterning of vacation life--on tours and cruises and at camping sites--will increase rather

than decrease in order to protect those who know nothing about boats, who do not know how to protect bathing children, how to build a safe campfire and later extinguish it, how to secure a tent in a rising wind or keep wet canvas from developing a leak,... Furthermore, most of these vacationers will be people who all their lives have lived in reach of experts--doctors, dentists, druggists, plumbers, carpenters, garage mechanics, electricians, firemen and policemen--who can take over in emergencies. They cannot overnight acquire independence of these experts on whom their comfort and well-being, sometimes their very lives, have depended since childhood.

Therefore, one of the predominant needs is for a bridge between the urban dweller's present knowledge of nature, which he has received from books, movies, and television, to the world of real nature. This is the point where the experience with nature ceases to be one of effortless and vicarious consumption and begins to demand at least the minimum effort of walking or driving. Interpretation is needed here to lead the visitor into some understanding and appreciation for his surroundings.

This is not to say that outdoor recreation need be educational to be justified; most observers today would find sufficient justification if it were merely pleasure-giving. But pleasure itself depends upon the individual's capacity to find contextual meaning--to see the inter-relationships within the natural world and to see himself within the larger environmental framework. As a member of the species and therefore as a participant in the total ecological system, a broader understanding of his place within this larger scheme can contribute in one additional way to his sense of personal identification. By attracting people into the natural world,

outdoor recreation opportunities unquestionably as a medium through which this broader understanding can be sought. And, in the larger context, increased popular respect for the natural ecological system can further the national goals for resource protection and enhancement. (Webber 1962)

Bridges between the city man and the forest environment exist to some extent already in the field of mass media with programming designed to interest and instruct the recipient in the out-of-doors as a personal venture (Kaplan and Lazerfield 1962).

Skiing is taught, but apparently everyone is expected to know about hiking, hunting, or camping. Boating is taught in some places; and, fortunately, boating safety training is becoming a requirement.

An outdoor recreation experience is an emotional experience as are experiences in art, music, or drama. Outdoor life can be well or poorly interpreted and appreciated in accordance with the training of both interpreter and audience.

Personal relationships and visitor satisfaction.--Recreation is an experience that may be strongly affected by the concepts and attitudes of recreation planners and administrators. And, for some of these, a change in concepts is needed to reorient their thinking to include large numbers of people into a situation that heretofore had contained only land, trees, water, and wildlife. However, reorientation of thinking should not be confined only to planners and administrators. Those conducting

research frequently have had less contact with people and are less skilled in public relations than administrators.

Researchers need to develop a better understanding of the skills of working with other people, not only to gain and maintain access to research situations, but also to accomplish the objectives of a particular study. The researcher's own actions are as much a part of the study design as the research instruments used. ...The majority of the researchers who attempt to do research today have good training in theoretical conceptualization and technical methods. They have not, however, been given much training at the action level, in human relations skills. (Mann 1951)

It is quite possible that foresters, having formed their concepts from the out-of-doors, may be peculiarly unsuited to the development of the forest environment for urban recreation users without a vastly increased knowledge of the urban dweller and his conceptual background.

The forests of the Northeast are a valuable resource. But their value is derived from their ability to satisfy people's wants and needs. So an appraisal of Northeastern forests and forestry opportunities must be based on Northeastern people--and the ability of these forests and forestry to meet the needs of their people. ^{16/}

^{16/} Stoltenberg, Carl H. Forestry opportunities of the people in the Northeast. An unpublished program for forest economics and marketing research on file at the Northeastern Forest Experiment Station, Upper Darby, Pa. 32pp. June 1960.

At the moment, the role of forestry in a heavily populated region like the Northeast is far from clear. Whether foresters will play a significant part depends on how well they handle the new issues of wild land management created by the dynamics of urbanization.

The first need is for foresters to psychologically adjust to the fact that they have a really legitimate cause for concern... Recreation is tainted with the old puritancial view that it is somewhat sinful, and the business of earning a living by producing physical goods is still thought to be somewhat better than improving the amenities that make a productive life more worthwhile. (Gould 1962)

Vandalism.--Vandalism is a widespread and complex problem

Fig 8. Wilson (1961) made an extensive study of vandalism with the cooperation of a wide range of park and recreation personnel. His findings substantiate the need for a careful sympathetic study of the requirements of the users. Vandalism is frequently oversimplified and the same is true of solutions offered. Success in the reduction or prevention of vandalism seems to hinge on the careful application of the principles of human relations once a wide range of circumstances. Wilson suggests study of legislation and ordinances on vandalism and further analysis of records of vandalism. He also recommends that work be done to improve the design of facilities. Soundly designed facilities seem to evoke less hostility and resulting damage.



Fig 8.--Vandalism is a complex problem.

Predicting Future Recreation Demand

Problem: What social and economic forces are at work in Metropolitan Centers that will influence recreation in the surrounding regions, and when and to what extent will these forces begin to exert pressure upon the forest recreation resources?

Sufficient studies have been made to show that the people from the city who camp in the woods at a distance from the city are not an economic cross section of that city (ORRRC 1962). This brings to mind a whole series of questions that may affect potential use: Why did these particular people come? What did they seek? Did they find it? Why didn't the remainder come? Might they come? Which part might come next? What might cause them to come? How many might come? When?

In the past, questions of this kind have not been considered much by managers of forest land, but now they are becoming more important.

The great reservoir of people.--Fifty million live in the twelve northeastern states. Most of the, 78 percent, live in urban areas. Close to 18 million live within 50 miles of New York City.

The Northeast is the most densely populated portion of the nation, Fig 9. Some states compare with the most densely populated nations. Numbers of people per square mile are as follows (1962 World Almanac):

Rhode Island	812.4
New Jersey	806.6
Massachusetts	654.5
Connecticut	517.5
New York	350.1
Maryland	314.0
Pennsylvania	251.5
Delaware	225.6
West Virginia	77.3
New Hampshire	67.3
Vermont	42.0
Maine	31.3

The state outside of the Northeast with the most persons per square mile is Ohio with 236.9.

Potential forest users are of many origins.--The Northeast is still the melting pot in a greater sense than any other portion of the nation. Boston and New York are still the gateways to Europe and the Near East. The 1960 census shows that 47.7 percent of the foreign-born whites live in the Northeast (Hauser 1962).

Ethnic groups still retain their identities; and political candidates are carefully selected on the basis of their being Jewish, Italian, Irish, Polish, or "Early Americans" who in turn still retain many characteristics of British, Swedish, German, or Dutch ancestry. In northern New England it is not uncommon to visit a forest campground or picnic area and hear only French spoken.

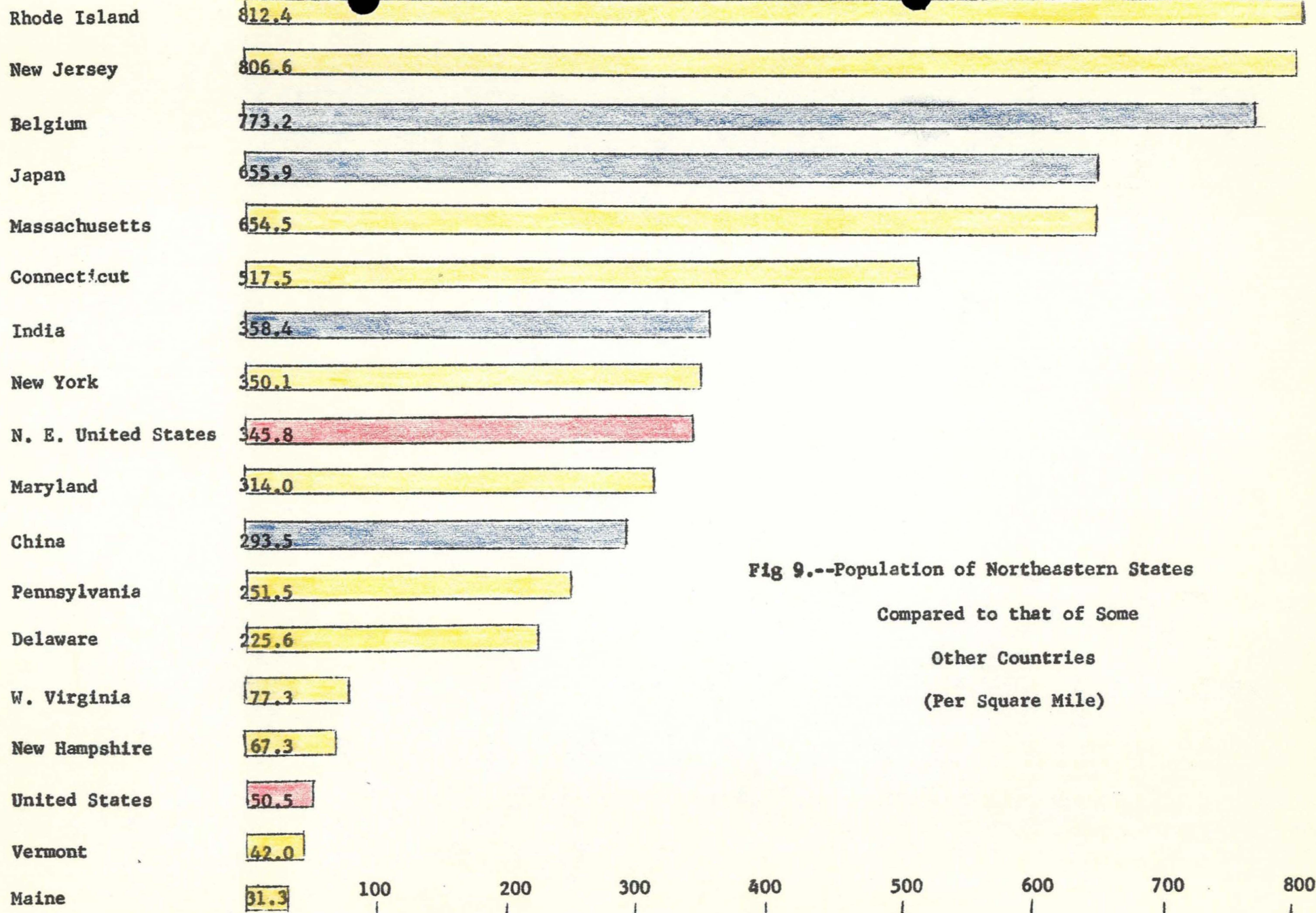


Fig 9.--Population of Northeastern States
Compared to that of Some
Other Countries
(Per Square Mile)

Beside the above, there are two new groups becoming important--the Negro who is coming in increasing numbers from southern states and the Puerto Ricans. About these latter two, Margaret Mead says:

Negro Americans, Puerto Rican and Mexican Americans, and groups from enclaves like the mining towns in the South form a...group whose recreation experiences have been extremely meagre and limited in the past. Depending on the direction and speed of social change, these groups, whose needs have been largely neglected, can bring about a great numerical change in the recreation pattern as it develops over the next generation. Because of poverty, ignorance, or segregation, they have not yet, to any appreciable extent, become part of the overall vacation and recreation groups in the United States. With increased incomes, decreased pressure of segregation, and a rising level of aspiration, changes in their participation, would add to the numbers of new vacationers looking for places to eat and sleep, bathe and fish, and learning to understand and respect the outdoors, which has not been much of a friend to them in the recent past.

There are large segments (It could be a majority,) of the population of the Northeastern region that are not the spiritual descendants of Davy Crockett, have no frontier seeking ancestors to look back upon, and could not be less concerned about it. Goode (1962), in a study of recreation demand, found that both men and women preferred "comfort and service" to "roughing it". In a study of the outdoor recreation activities and preferences of Delaware Basin residents, the chief requirements for a day's outing were activities and "comfort and service" (National Park Service 1958).

Lack of outdoor skills and knowledge of the environment may quickly discourage the inexperienced urbanite. Undue discomfort or fear may make some hesitate or refuse to return to a seemingly unpleasant or hostile environment. A small harmless grass snake sometimes creates a considerable wave of emotion in a campground, with mothers and fathers showing fear and concern for their children. Any snake can quickly become a "rattlesnake" in retelling, and often the proportions become enormous.

It might be well to think of many varieties of "urban man" each occupying an ecological niche in the sense that Odum (1959) defined it: "The ecological niche...is the position or status of an organism within its community or ecosystem resulting from the organism's structural adaptations, physiological responses and specific behavior (inherited and/or learned)."

Presently occupying niches in cities are other important groups who may affect future forest recreation programs, Mead (1962) mentions two groups:

In the present use of our natural outdoor resources adolescents are the most neglected group; therefore, new developments involving this group might produce the greatest changes in recreation and land use...The second most neglected group--again a very large one--is that of women who are alone. It includes women who have no families, women who work all year and have paid vacation, and retired, divorced, and widowed women who have no partners on whom to depend for vacations... In looking ahead, this is the group whose recreation should not be left to chance.

There are other important groups, each constantly changing in relation to the other and to the American society as a whole. Although the changes undergone by each group are quite different in many respects, they follow essentially the same pattern (Hauser 1962).

Regardless of the urban dwelling or of the niche occupied, the out-of-doors is a part of the heritage of every citizen. When conditions permit, he or his children may wish to claim his or their portion. His needs and desires may not correspond to the preconceived ideas of recreation planners and administrators. For this reason, careful consideration must be given to those social and economic factors which affect the nature of outdoor recreation as well as the volume and space required. This is a large problem, and much of it is beyond the scope of this recreation research project; yet, these forces should be recognized and evaluated. Social scientists at work on forest recreation problems should initiate research in these fields and perhaps should carry out some of the studies.

The need for studies to learn the preferences of various categories of city dwellers for forest recreation types and facilities was emphasized in ORRRC report (Ferris 1962). Additional studies of this type might discover the reason why many groups make no use of forest recreation. From our present knowledge, income level seems to be the threshold factor; but other factors, such as: education, occupation, ethnic group, or social class, may be just as important.

Some sociologists have advanced the theory that recreation pursuits are an index to personality (Sessoms 1962). If this is true, it might also be true that occupational groups would show similar recreation-personality characteristics. Another question that may have considerable merit has to do with the rural background of the urbanite or his parents. Perhaps the present rush to outdoor recreation is the result of an atavistic impulse on the part of a transitional group that will disappear when the next generation is urban born and reared. It may be that one of the most important questions that could be asked of an urbanite user of outdoor recreation would be: How many of your grandparents were born on a farm?

Financial Aspects of Organization and Management
Of Forest Resources for Recreation Use

Problem: What are the costs and returns from
the various types and sizes of forest
recreation installations in relation
to their organization, management
practices, location, and other factors
affecting financial efficiency?

Recreation demand has grown so rapidly and the pressure for development of facilities for recreation has been so great within the past few years that there has been but little opportunity to make careful objective studies of organization and

and operation costs. A large portion of the existing facilities were built during C.C.C. days under economic conditions so different from the present that cost figures based on that construction is of little value for analysis. In most instances the recent increase in demand was absorbed without substantial changes in organization. In some instances there was little or no increase in personnel. Provision for expansion of recreation facilities was on a hit or miss basis with the situation being complicated by near emergency conditions.

Sufficient time has passed to indicate that recreation is a use of the forest that will remain at high levels in some areas. Public agencies are developing well-conceived plans for recreation, and private investors are entering the field in increasing numbers. Measures of costs and returns from the recreation enterprise are needed as a basis for wise investment of both public and private funds.

An improved basis for allocation of workloads of recreation workers is needed. For many workers, recreation responsibilities have been a part-time, or, in some instances, one of over-time or extra-duty status. Results of workload and organization studies could assist both public administrators and private operators to set up efficient manning plans or assist in labor-management negotiations.

Analysis of costs and returns from recreation areas of different sizes is needed.. Along with this, studies are also needed to analyze costs of various types of recreation. For example, what is the cost of the average man-day of swimming at a beach with a capacity of 500 as compared to one with a capacity of 1500? Or, what is the cost of a man-day of picnicking, skiing, hiking, etc.? With answers to such questions available, fees could be adjusted to reflect the differing costs of recreation uses.

Whether or not fees are to be charged on public recreation areas is a political decision. Such a decision is subject to attitudes of people rather than to research results, but the size of the fee that is necessary to cover costs should be determined. The decision as to whether or not collecting fees at small widely scattered areas should be based upon some knowledge of the cost of collection on various sized units.

Studies within this problem should assist in setting levels for costs for various kinds of forest recreation activities and for the various levels of facilities demanded. Charges at a campground with piped water, flush toilets, showers, a bathing beach, and shuffle-board courts might not be higher than for a more primitive camp because the primitive camp might be so isolated that maintenance costs would be very high. In this instance the quality elements of space and "backwoodsi-ness" may be as costly as the shuffle-board courts and other "improvements" in an area where use is more concentrated.

Private landowners are being encouraged to invest in recreation enterprise. The ORRRC Report (1961) recommended that private enterprise assume a large part of the task of furnishing outdoor recreation. Farm lands are being converted from croplands to recreation, Fig 10.

These land conversions frequently are made with the help of government loans. All such investments will be subject to tax. Indeed, improvement of the tax base is one of the benefits which communities are seeking from an expanded recreation industry. There are few, if any, studies that will assist investors to calculate depreciation rates for their recreation investments. The same information is needed for public enterprises, except in this instance information would be used for calculating maintenance rates for various enterprises. There may be another field where depreciation should be considered. On some areas of private forest land that are being used by the public for recreation, there may be a depreciation factor assignable to recreation.



Fig 10.--Farm lands are being converted from crop production to recreation.

Evaluation of the Social and Economic Benefits
Of the Use of Forest Resources for Recreation

Problem: How may forest recreation values be
determined and compared to other uses
of multiple-use forests, or singly
against specific, competing uses for
land?

Since recreation is an activity pursued for personal satisfaction, the values derived from recreation are individual, most of which could not be accurately weighed even by the participant. This may be just as well because it is very likely that analytical dissection of the experience would destroy its charm. On the other hand, the sum of the individual experiences in recreation results in a social force that is held in such high regard that some states spend millions of dollars in an effort to enlarge the opportunities for outdoor recreation within their borders. These expenditures are based on trained judgment and political intuition, not upon experimental evidence or a quantitative evaluation of the social benefits of forest recreation because, at present, there is no recognized procedure for stating such values. With such large sums being spent for recreation, some expression of value is badly needed.

Intangible values in commerce.--Any study of recreation comes eventually to an assessment of social values. A business may be established in the field of recreation with profit as the sole motive, but the success or failure of that business will certainly be affected by the public's evaluation of the commodity sold. This premise is well illustrated by the advertisers of prestige automobiles, diamonds, perfumes, or wrist watches. Travel advertisements offer such values as rest, excitement, enhancement of prestige, and even romance. All of these advertisements are directed toward the people who can afford these luxuries (or at least can arrange to pay for them) and who seek these personal satisfaction values.

The values of recreation may include those listed as well as others such as the opportunity for solitude or the close-knit companionship of a forest camp, Fig 11.

Personal values of recreation.--Recreation may serve widely different purposes to the members of a single group or have more than one meaning to a single individual. It does serve human need. Whether or not the need is one of the results of transition from a rural to an urban life or whether it will become one of the needs basic to urban living remains to be seen.

Recreation may compensate for the deficiencies of daily life by providing physical rest for the manual laborer, physical activity for the confined worker, or an opportunity for perception and excitement for one whose life is filled with monotony.



Fig 11.--Recreation values may include hard work with a close-knit group. (Photo courtesy of New York State Department of Conservation).

Recreation may serve as a means of discharging aggressive drives. The successful accomplishment of some physical activity may provide an emotional outlet that might otherwise have resulted in an accident; or shouting, running, or splashing may provide a means of throwing off the effects of oppressive restraint. Many people need relief from the clamor of the daily news, threats of hemisphere subversion, the swift regularity of installment payments, or even family pressures. Recreation can provide a period of forgetfulness, rest, and refreshment which enables the participant to return to bear everyday burdens with less irritation (Anderson 1955).

Social hunger is demonstrated by the way that fashion and status enter into recreation demand. An example can be drawn from water sports. At any of the "better" docking facilities, the casual observer will see many people using their boats, particularly the larger cabin cruisers, as a place to sit and be seen by others and perhaps to be used as an opportunity to exchange small talk with their social betters. The opportunity to wear pretty outfits undoubtedly draws many girls and some men to the ski slopes.

There is no reason to doubt the pleasure of the man who accumulates large numbers of the finest tools, i.e., guns, fishing tackle, boats, etc., for outdoor recreation and who apparently gets his pleasure from purchasing, owning, and showing his treasures rather than using them.

Recreation and mental health.--Assessment of the value of of the out-of-doors and outdoor recreation has been attempted for mental patients. The value is not high and may be negative. Mental patients need the stimulus of other people to recover reality, and it is quite reasonable to assume that a mental institution in the center of a city would be superior to one isolated in a rural area.^{17/}

^{17/} Personal communication with Dr. J. C. Urbaitis, Assistant Supt., Pennsylvania State Mental Hospital, North Warren, Pa. July 24, 1963.

Recreation and delinquency.--At one time recreation was presumed to be a cure for delinquency, but there appears to be as much evidence against this assumption as for it. Gans (1962) says the following about delinquency and mental health:

As far as I know, there have been no reliable empirical studies of the relationship between outdoor recreation, mental health, and mental illness. There have been some studies of the impact of playgrounds and community centers on anti social behavior, e.g., delinquency, which raise serious doubt about the existence of any impact beyond the reduction of minor vandalism due to boredom... My basic assumption...is that satisfying leisure behavior is a part of the good life, and therefore, a constituent part of mental health. Consequently, the recreation facilities which help to make leisure satisfying are necessary for mental health. However, I do not believe that recreation generally, or outdoor recreation specifically can by itself bring about or materially aid in the bringing about of mental health, or that it can cure or prevent mental illness. Likewise, I do not believe that

outdoor recreation is more environmentally favorable in terms of mental health values than other environments, or that there are significant relations between outdoor recreation, physical fitness, and mental health.

The terms of evaluation.---There is some frustration in attempting to weigh a social value because our society has so completely surrendered to economic appraisals that everything has to be expressed in monetary terms. Perhaps social values should be weighed in human terms rather than in dollars.

Since public forestry programs depend on appropriations, forestry policy must conform to the will of the people expressed through their elected representatives. The real question is whether people need incomplete and sometimes unrealistic monetary measures of cost and benefits to render sound judgment on forestry projects or whether they can be trusted to make wise decisions without them. Perhaps all public projects designed to produce intangible social values should be determined on a basis similar to that used in providing for public education, police protection, or national defense. Perhaps those who know the social values from forestry and who are convinced of its value could do more to further their cause by dropping a defensive attitude that relies on dollar values and concentrate on informing the public of the real meaning of these social values. Then the ballot box rather than the market place would provide the means of expressing the public will. (Marquis 1951)

We measure wood by board feet or cords, and water by acre feet or gallons. If we had not dollar values, we could still say that enough wood was produced to build homes for a certain number of people; or, we could say that a certain number of acres were irrigated, and drinking water for a given number of animals

and homes was provided. On the other hand, while bringing in game or fish makes that recreation effort more fun, it might confuse recreation with commerce to use pounds of fish or game as a measure of satisfaction from hunting or fishing. Recreation is a need that is now being expressed along with the need for food and water. Perhaps the best measure is participation as an expression of satisfaction.

It might be best to regard number of users without regard to quality. It could be possible that the serene complacency with which "quality" recreation values frequently are defined is as unwarranted as that of industrial management representatives who design elaborate employee benefit plans only to find them rejected by the workers. Webber (1962) describes some instances where the intent is good but the viewpoints are different.

The depth of emotional expression with which people discuss the out-of-doors and outdoor recreation is an obvious clue to the importance that these have for their individual psychological makeups. Many who find status and self-gratification in the luxury resort look down upon those who camp out in sleeping bags. Many who find status and self-gratification through back-packing in the wilderness deride the luxury resort's comfort and decry the "invasion" of lower-class dancehalls into the mountain towns. The intensity with which these attitudes are voiced suggests that something quite personal is at stake; perhaps each different approach represents a challenge to one's own views and hence to his self-image of adequacy. It suggests that outdoor recreation is deeply involved with the individual's problems of self-identification.

Only the individual can define quality in recreation and only for himself. In defining it for others, photographers, artists, and poets undoubtedly do a better job than scientists. But, in spite of all this, it is necessary that some summation of all of these values, the social value, of recreation be appraised in terms that will assist in making such decision as whether 70 million or 170 million dollars are needed for added recreation land and facilities in a state or how to choose between alternative uses of land in terms of the greatest social good.

PROBLEM SELECTION

Basis for Selection

The importance of a research problem is of first consideration in the selection of a study program, but it is not always possible to begin with the most important problem or with the most important studies within the scope of a problem. In a new field there are techniques to be discovered, tools and models to be built and tested, and other necessary but sometimes unglamorous jobs to be done. Less important but immediate problems often require solution before more distant and higher level attempts may be made.

One criterion for selection is the potential applicability of results. Many problems bear indirectly upon recreation; some important problems are peripheral and some bear directly upon the use and management of the resource. On the other hand,

broader and more long-range aspects of management research should be emphasized because research oriented to the solving of specific local problems frequently has but little application elsewhere.

The capability of the research unit in number of scientists, their training, and the funds and facilities available to support their work must be considered in problem selection. Selection may be adjusted as funds and personnel become available; or, if the problem is sufficiently important, funds and personnel may be assigned to increase the capability of the unit as required.

The stage of development of a field of study is important in problem selection and also in study selection within problems. As a field of study develops, orientation improves and it is possible to locate an area for research in depth with some confidence. On the other hand, in the early stages of development it may be necessary to consider a wide scope in order to obtain the desired orientation. This may even require that some study be made in related problem fields. This situation would occur most frequently in the adaptation or development and testing of research methods and techniques but would not necessarily be confined to that objective.

Selection of Problems

The following three problems have been selected for the Forest Recreation Research Program of the Northeastern Forest Experiment Station for the immediate future. The problems are in general order of priority, but the more important studies in each problem field should be attacked before time and funds are spent on secondary studies in the higher priority problems.

1. The natural landscape.--What methods of managing the forest landscape will provide for the greatest welfare and satisfaction for the visitor seeking recreation in the forest, for the best allocation of the recreation resource and the greatest protection of the forest at least cost?

Results from studies of the protection and management of the forest recreation landscape are needed by hundreds of private and public recreation managers now, regardless of whether or not there is a further increase in recreation demand.

It is quite probable that research in this problem area may point to ways of increasing present recreation capacity. To the extent that this can be done, the demand for new areas could be reduced with accompanying savings in funds for land purchase. Development funds might or might not be reduced.

The present project staff is experienced in this kind of research. Although consultation with specialists in other disciplines would be needed from time to time, no addition to the present staff would be required for work on this problem.

2. Estimating present use and demand.--How
may useful estimates be made of the present volume,
type, and distribution of the employment of the
recreation resources and of the preferences of people
for the various resources, activities, and facilities.

This problem is very important because the success or failure of recreation ventures depends upon an accurate appraisal of this demand. This is important to recreation planners in the National Forests, in other public agencies, and in the private sector. Results of these studies would be of great assistance in the location of recreation areas under the present programs now under way in many Northeastern States.

The present research staff has some experience in this problem. In some areas consultation with the Economics Division of the Station would be needed. Before any great penetration into this problem is attempted, an economist should be placed on the staff; but there are studies needed in this problem, in support of research in recreation management, which are within the present capability of the project.

3. The developed resource.--What type, amount, distribution, and combination of structures will provide the people with the best access to the forest, with health, safety, and with enjoyment of the forest environment commensurate with protection of the forest at reasonable cost?

The very heavy investments being made by states and other governments and by private individuals gives this problem a prominent place. Guides are needed for improving the design of recreation areas, for efficient garbage and sewage disposal at lower costs of installation and maintenance, and for improvement in trails, boat launching areas, and other facilities.

The present research staff has some experience in this problem. Also, the Buckaloons Recreation Area on the Allegheny National Forest and immediately adjacent to the Laboratory has been designed and constructed to facilitate such research.